

A toolset for implementing Ecosystem-Based Management



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Ocean Research & Conservation Association

www.teamorca.org



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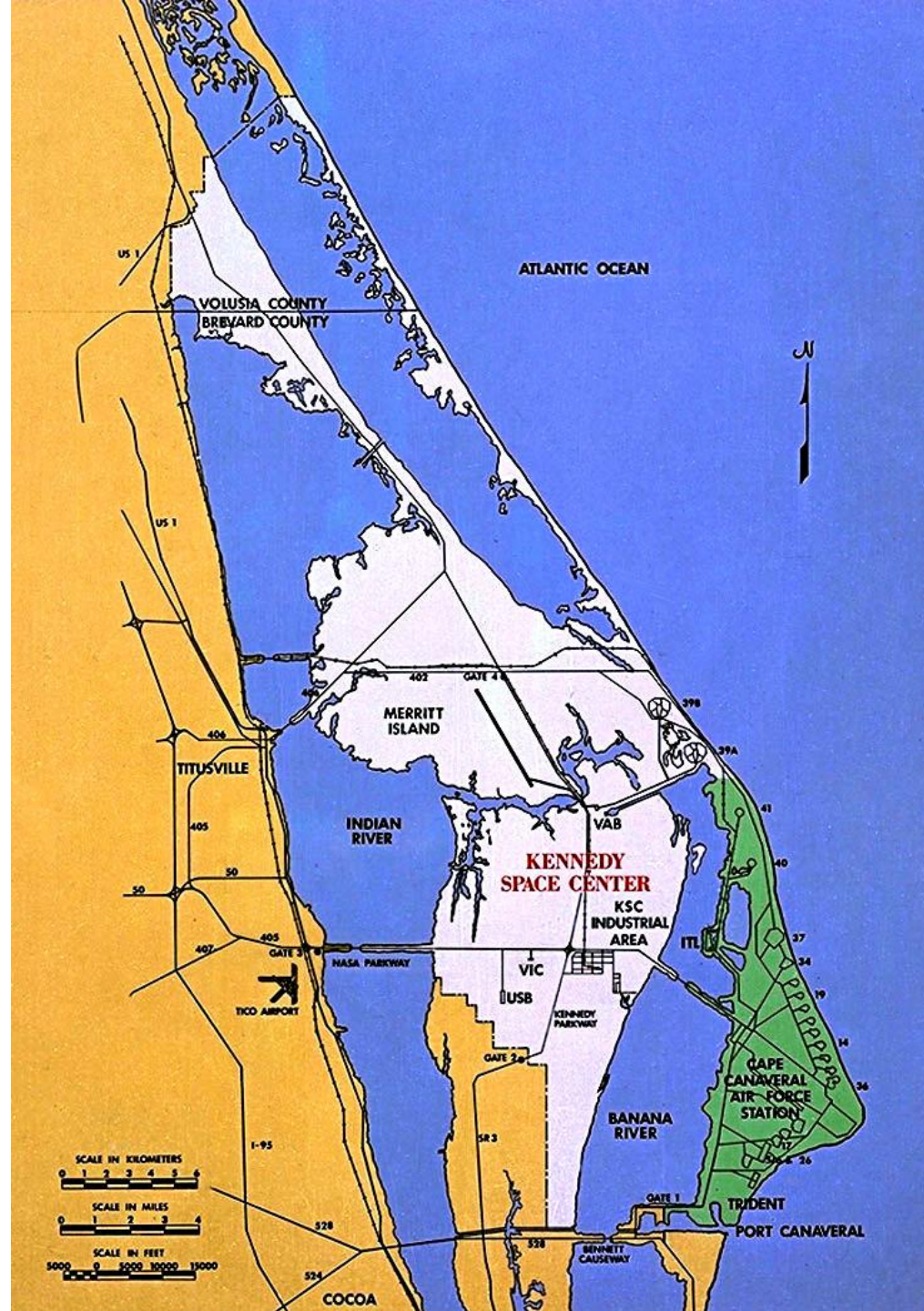
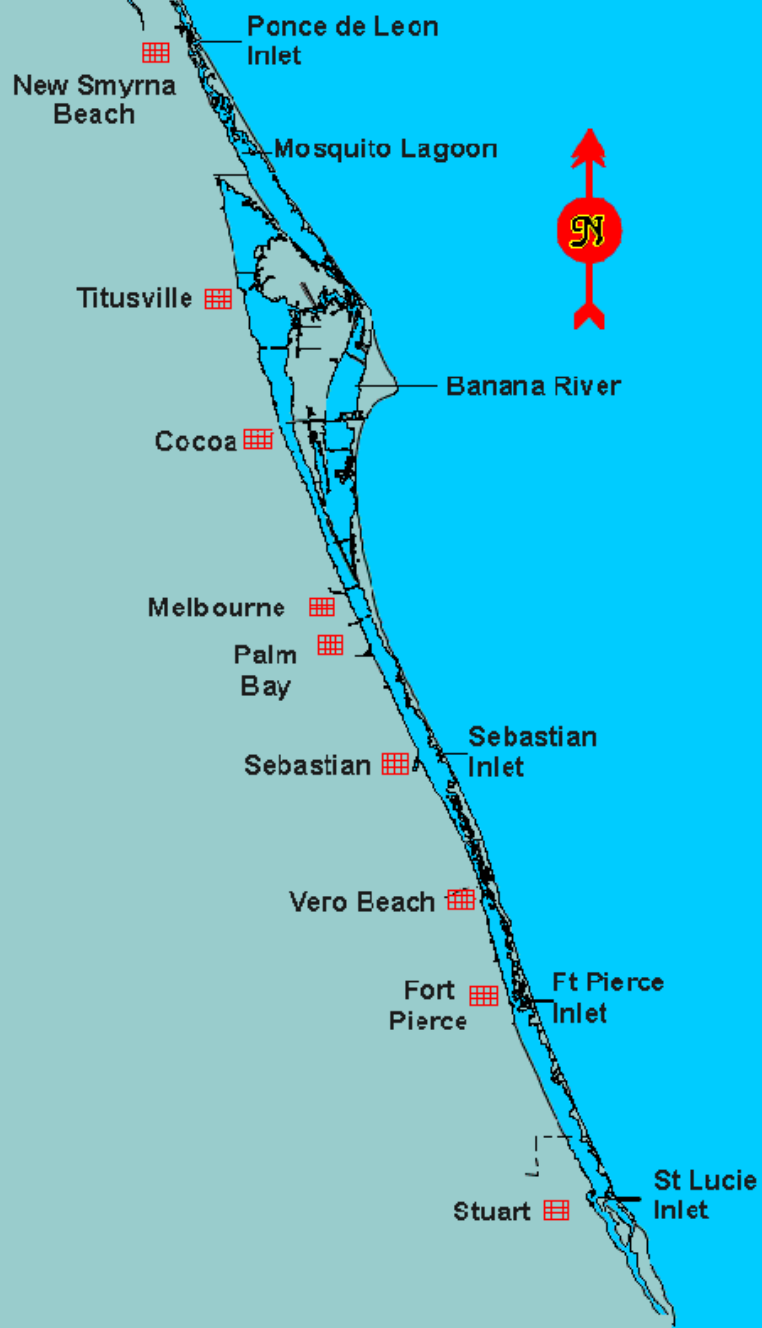
Ecosystem Based Fisheries Management

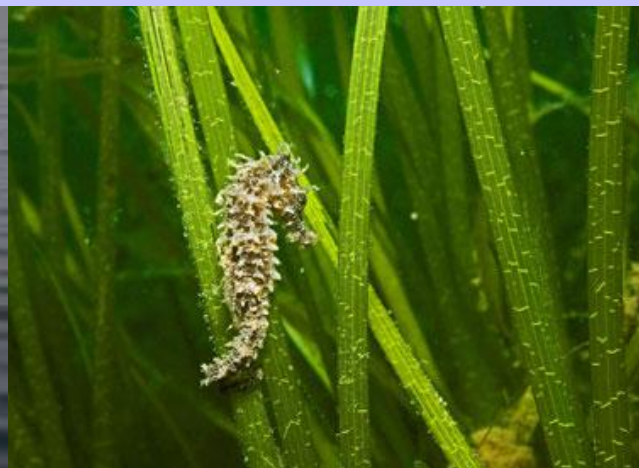


Measure ecosystem health using indicators of environmental quality and system status



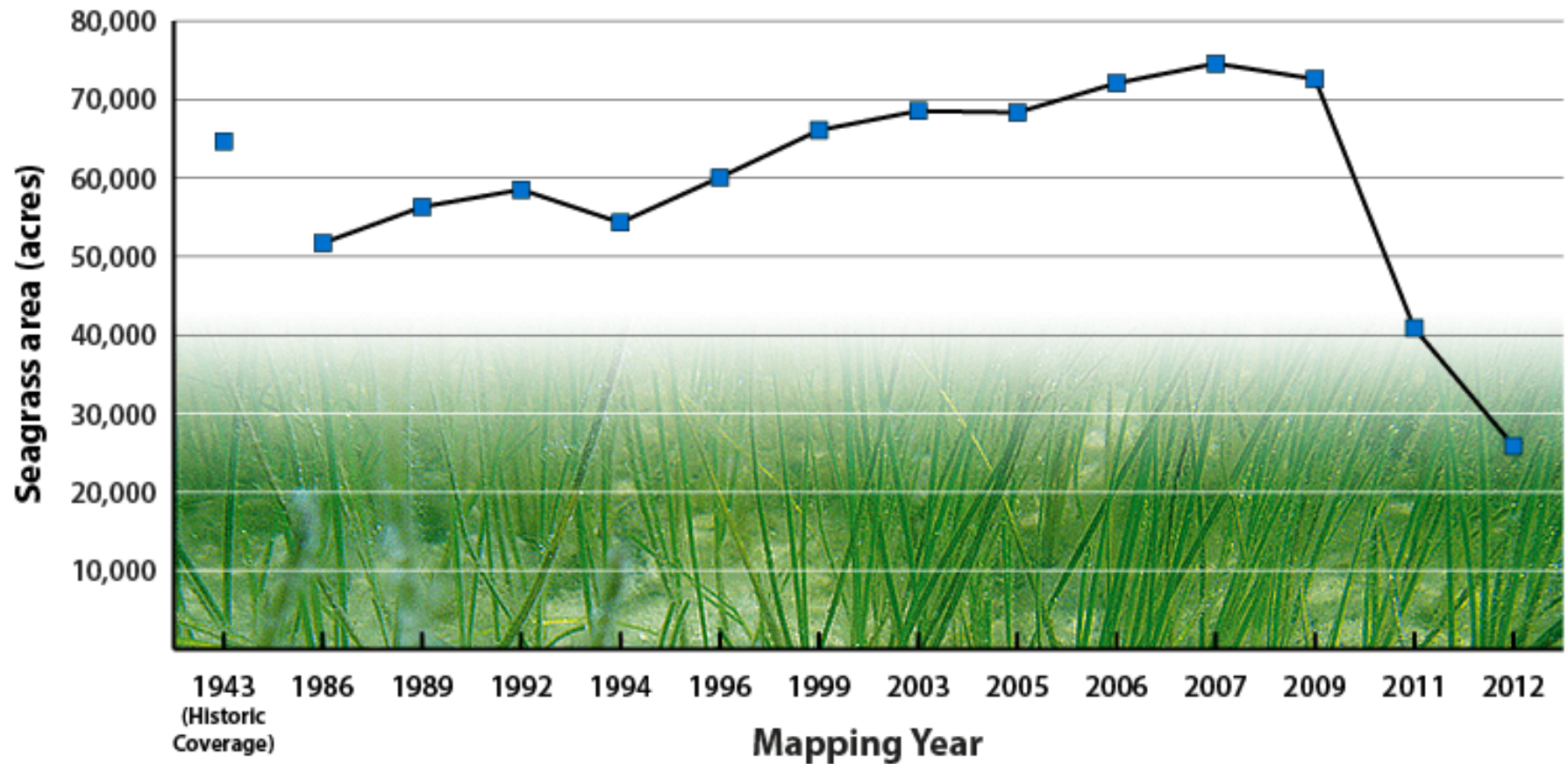
INDIAN RIVER LAGOON





Indian River Lagoon Seagrass Coverage

(within SJRWMD to Fort Pierce Inlet)



- Aerial photographs of lagoon seagrass are taken every two years and new seagrass maps are produced from this photography. Scientists monitor seagrass transects and collect water quality samples monthly.
- Scientists recorded a 60 percent loss of seagrass in the lagoon between 2009 and 2012.







Basin Management Action Plan

BMAP = “Blueprint” for restoring impaired waters

Reduce pollutant loading
to meet limits according
to Total Maximum Daily
Load (TMDL)

The TMDL Process

Assess the state's waters



List those that do not meet
standards



Identify sources and reductions
needed
(TMDL Study)



Implement restoration activities
(Implementation Plan)



Evaluate water quality

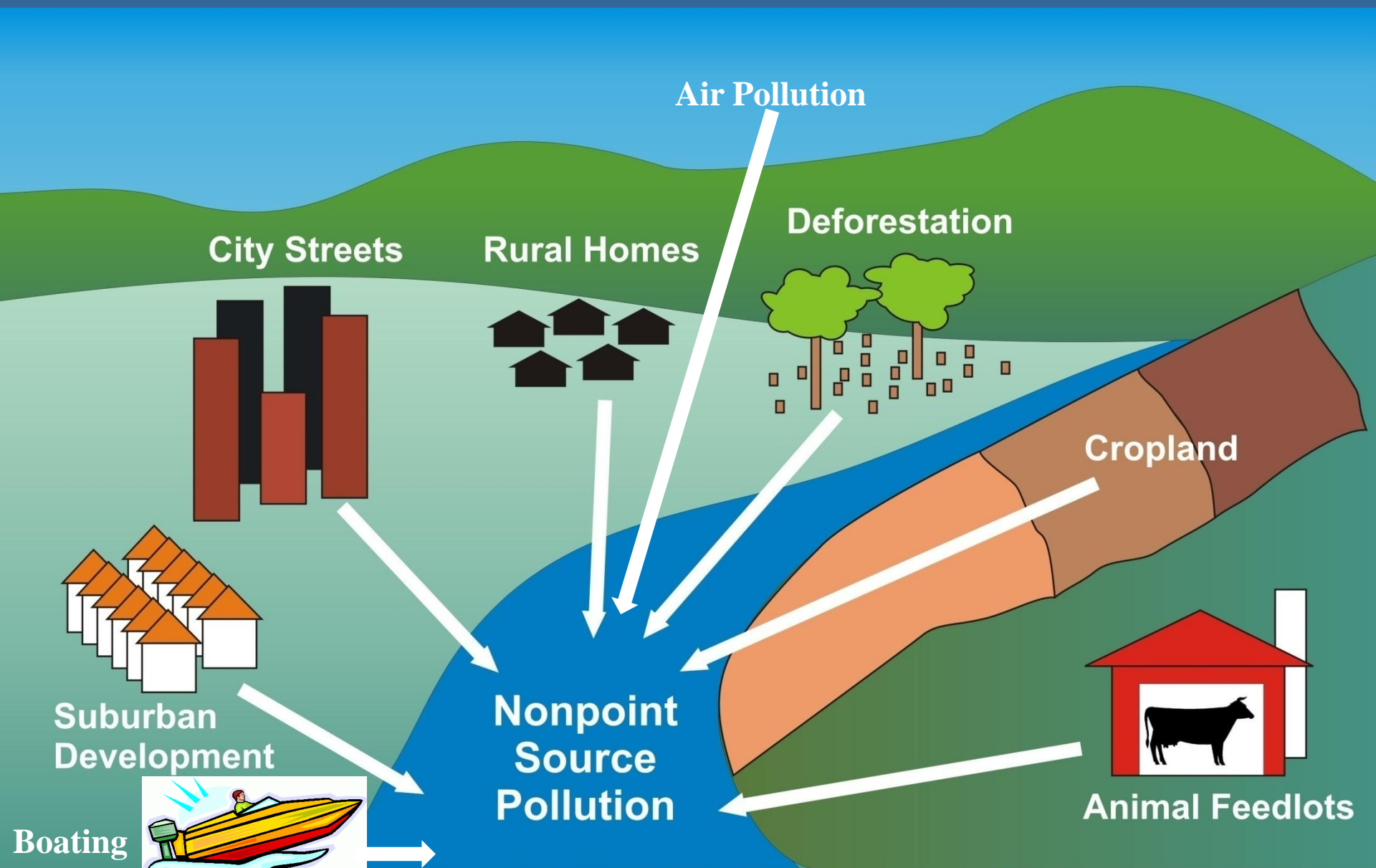
Ocean Research & Conservation Association

MISSION: To protect and restore aquatic ecosystems and the species they sustain through the development of innovative technologies and science-based conservation action that leads to successful solutions.



TAGLINE: Mapping pollution, finding solutions
IRS 501(c)(3) Nonprofit Corporation

Nonpoint Source Pollution







Finding Pollution Sinks

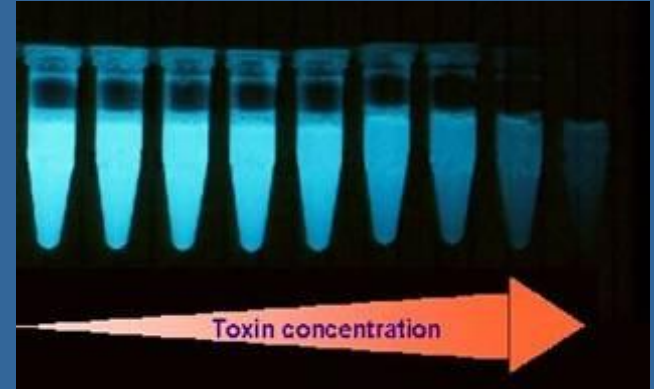
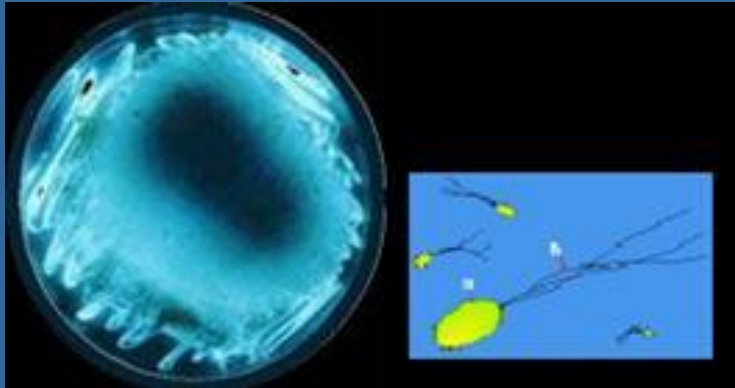




FAST

FAST ASSESSMENT OF SEDIMENT TOXICITY

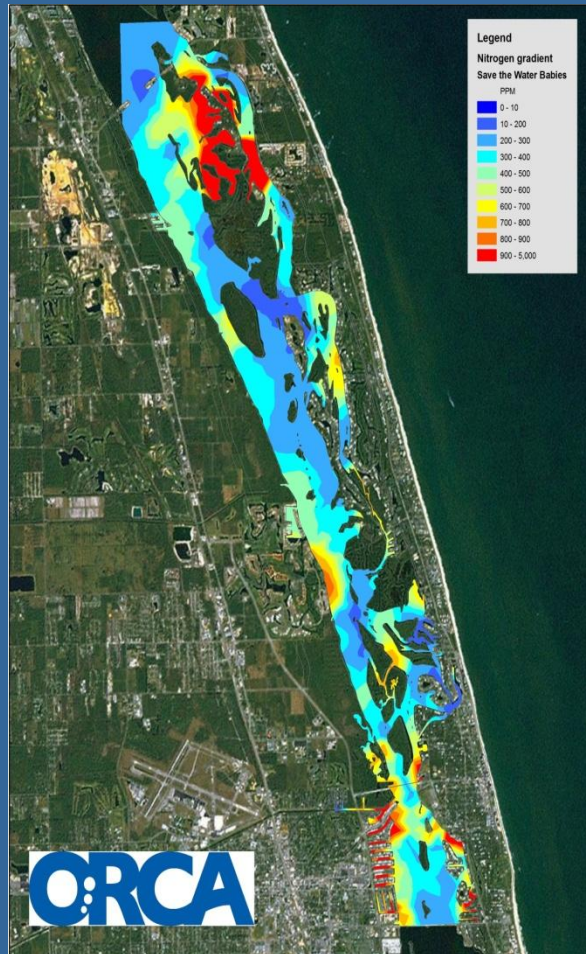
MICROTOX BIOASSAY



Pollution Gradient Maps Indian River County

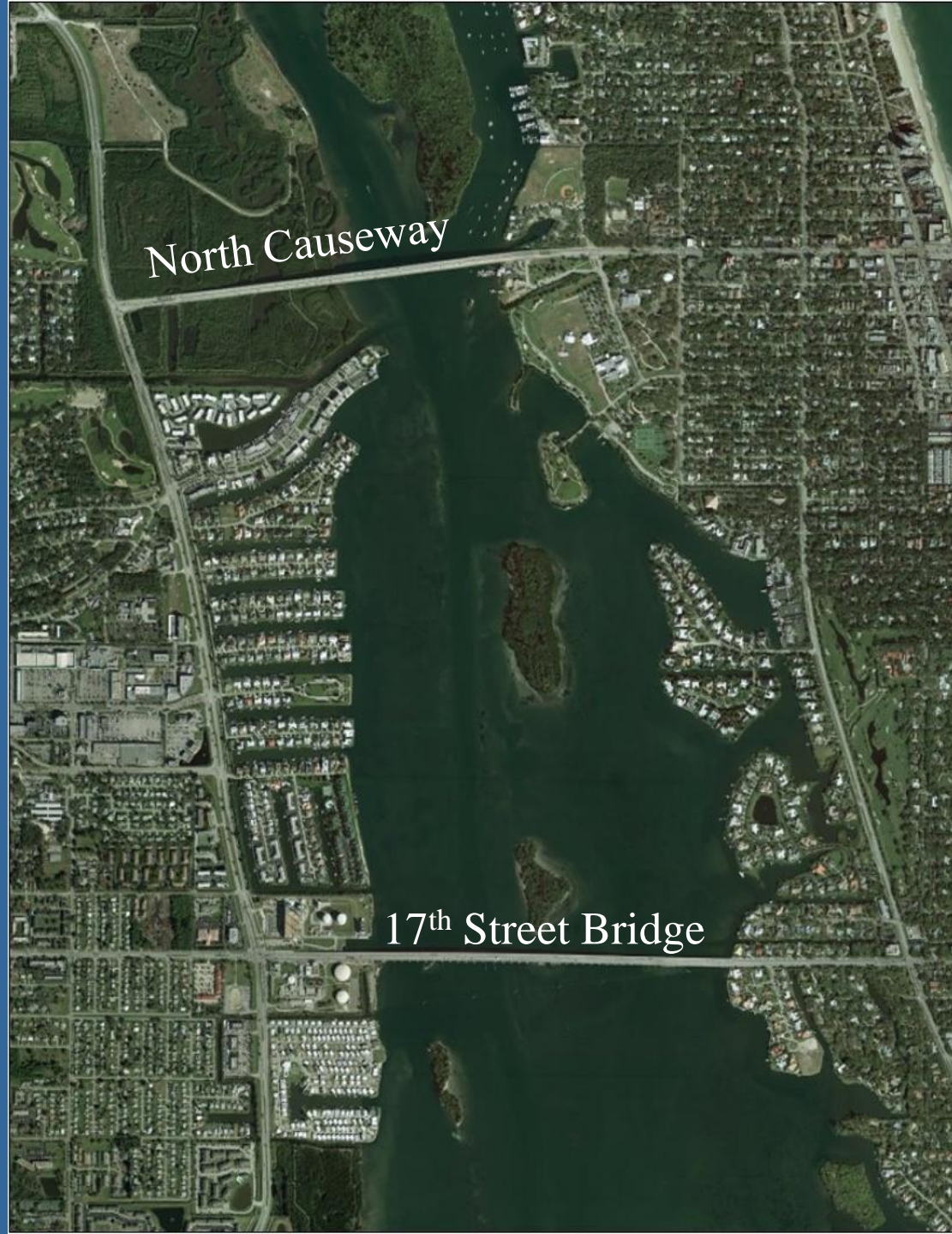


Relative Toxicity



Total Nitrogen

Vero Beach Map a Mile

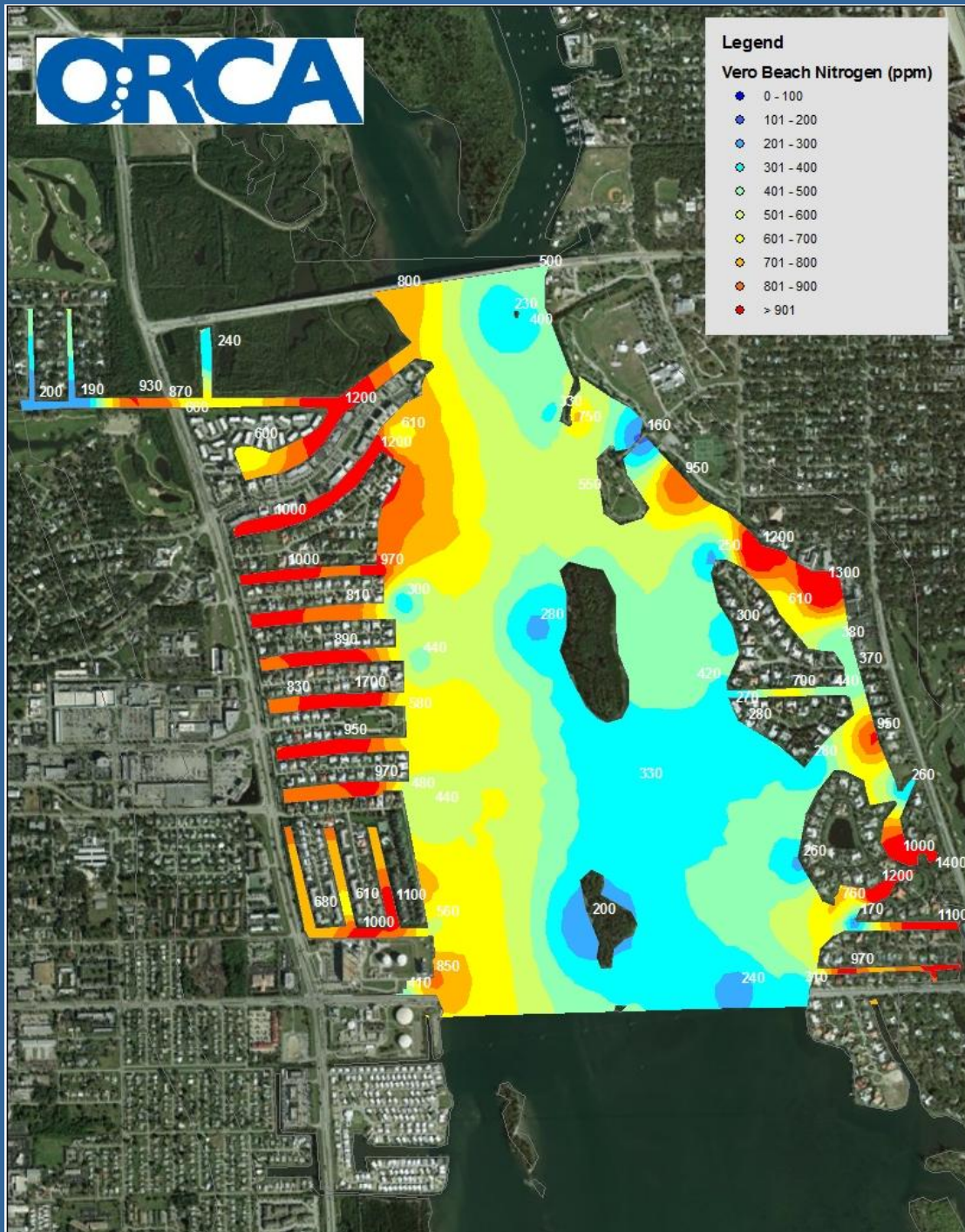




Legend

Vero Beach Nitrogen (ppm)

- 0 - 100
- 101 - 200
- 201 - 300
- 301 - 400
- 401 - 500
- 501 - 600
- 601 - 700
- 701 - 800
- 801 - 900
- > 901





Leave grass clippings on lawn for “grasscycling”





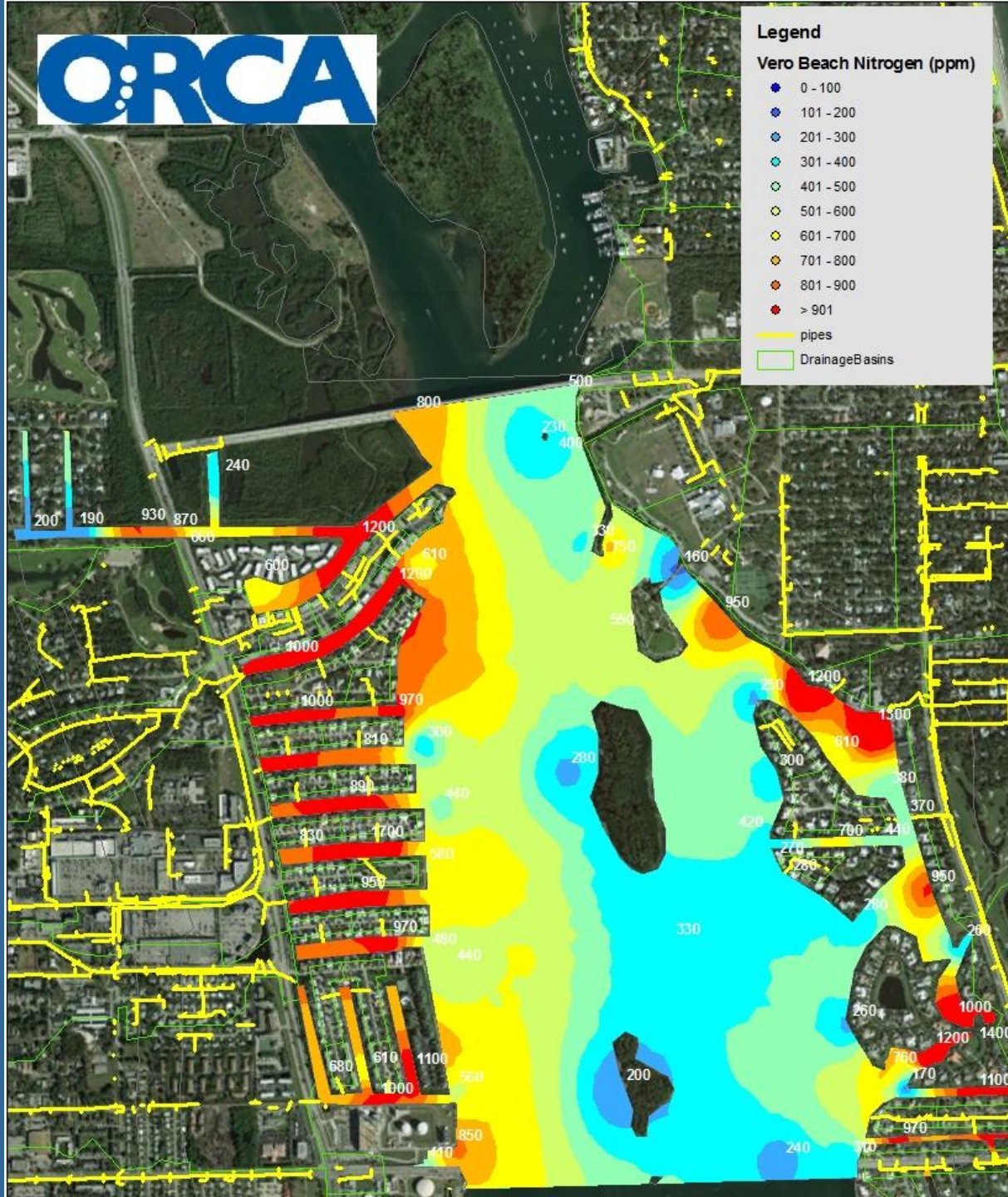
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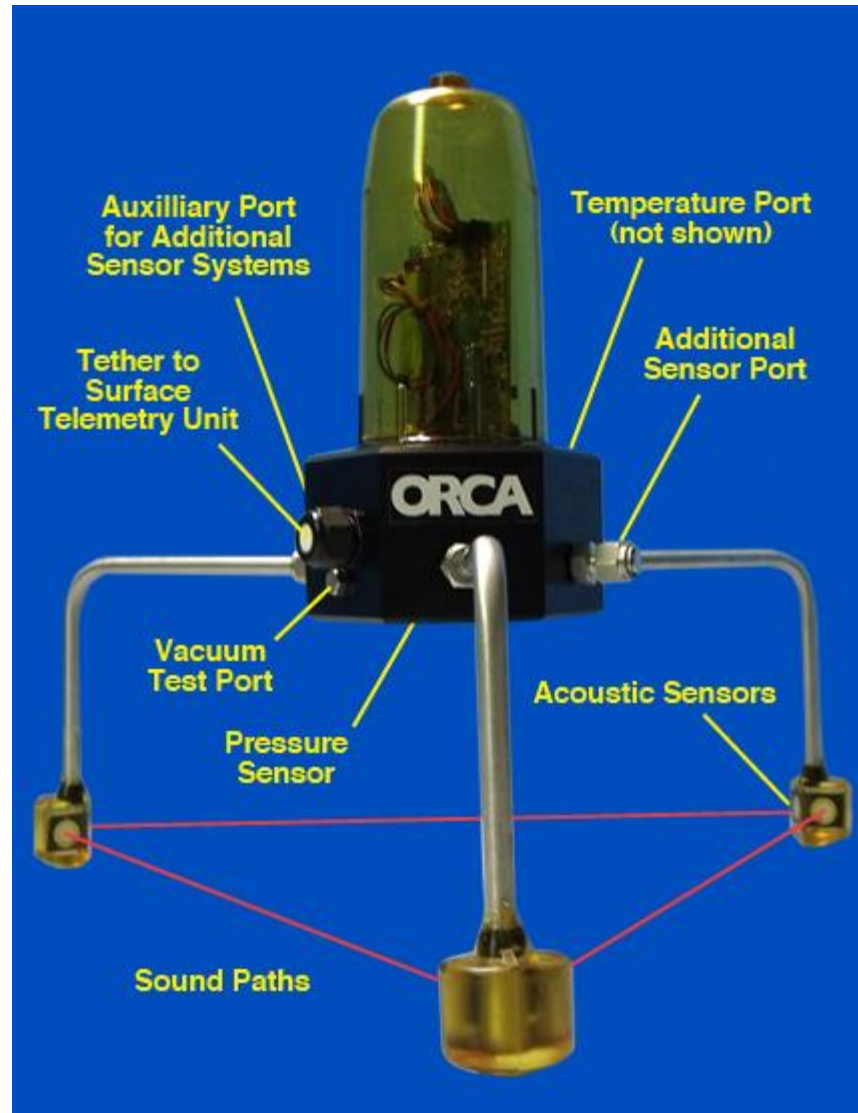
pipes

DrainageBasins



ORCA

18"





Kilroy ecosystem monitoring

- Real time
- Wireless
- Low cost
- Easy to install

Kilroy
Sensor
Suite



Solar
Panel

Kilroy's Voice
(Telemetry Unit)

Kilroy's Hatrack

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OCEAN RESEARCH & CONSERVATION ASSOCIATION

CHANGING THE NATURE
OF AQUATIC CONSERVATION

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HOW CAN REAL TIME MONITORING HELP THE INDIAN RIVER LAGOON?

ORCA IS DEDICATED TO THE PROTECTION & RESTORATION OF AQUATIC ECOSYSTEMS & THE SPECIES THEY SUSTAIN THROUGH THE DEVELOPMENT OF INNOVATIVE TECHNOLOGIES & SCIENCE BASED CONSERVATION ACTION. PLEASE HELP SUPPORT OUR MISSION.

[MAKE A DONATION](#)

KILROY
IS
HERE

Live Kilroy Data

View live, realtime Kilroy data and meteorological data from the Ft. Pierce Inlet, FL.
[View Feed](#)



Ocean Research & Conservation Association

[Like](#) 2,037

LATEST HEADLINES



The Campaign for a Clean Indian River Lagoon

ORCA has created a Campaign for a Clean Indian River Lagoon. The plan includes simple steps; first we will create a pollution gradient map of the entire 156 miles of the Indian River Lagoon. Then we will install 50 ORCA Kilroy™ water monitoring devices in the lagoon. With



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KFL0008

ProPS

Salinity

D.O.

Kilroy

'West Inlet'

The basic Kilroy™ sensor suite measures flow speed, flow direction, water temperature, water level, GPS location and power. Additional sensors incorporated into different units include an ORCA-designed turbidity sensor (ORCA™), ORCA-designed flow-through bathyphotometer (ORCA BP™) to measure bioluminescence as well as third-party sensors including salinity, pH, dissolved oxygen, nitrate and phosphate.

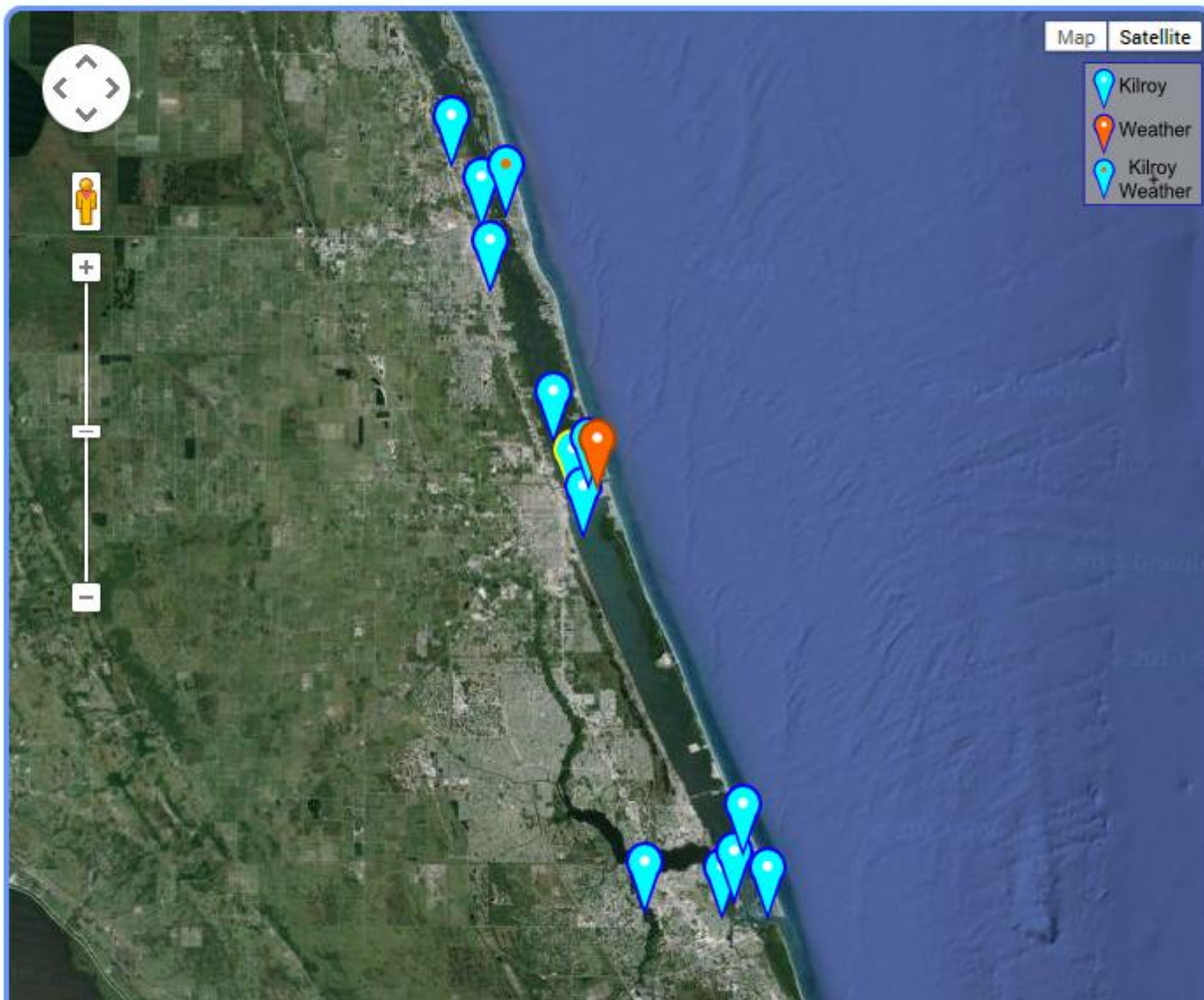
Flow Speed 0.265 m/s (0.592 mph) ⓘ
Depth 0.89 m (2.93 ft) ⓘ
Flow Direction SSE (168°) ⓘ
Water Temp. 22.7°C (72.8°F) ⓘ



Fort Pierce Inlet Project - location 'West Inlet'

Plot Historical Data

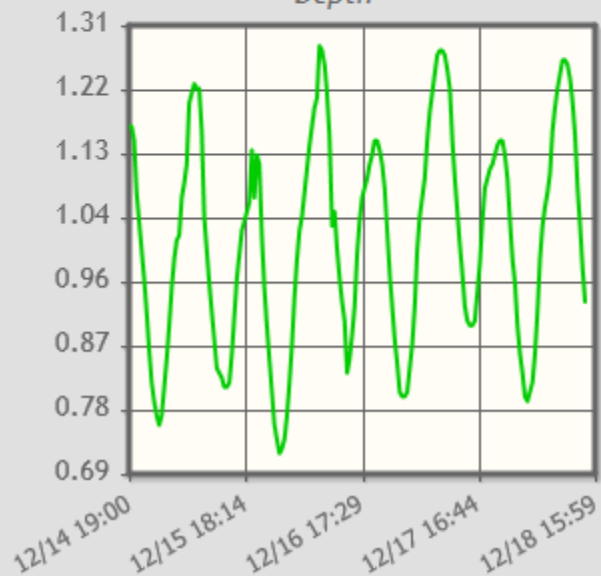
Enable Flow Animation



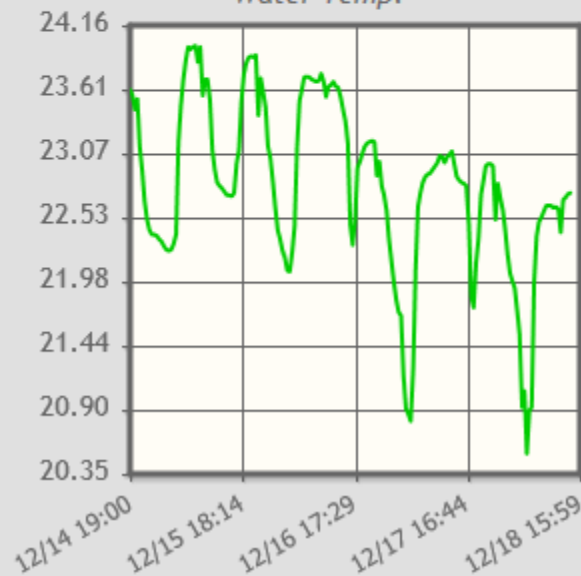
Measurements for KFL0008 - 'West Inlet'

3 Day historical data, drag box to zoom, double click to return to full zoom.

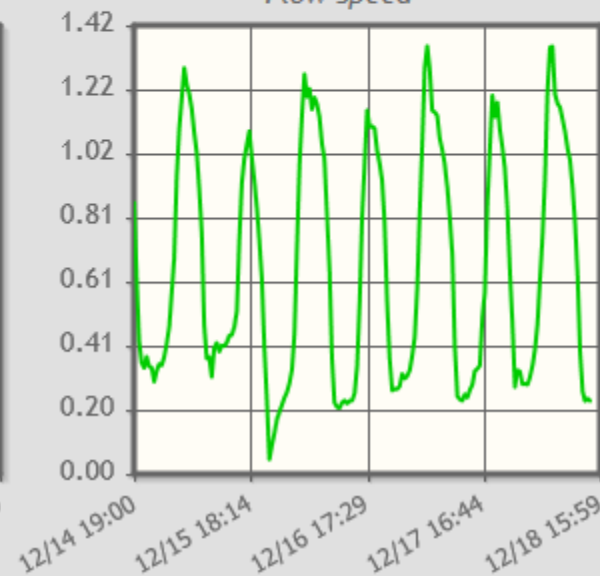
Depth



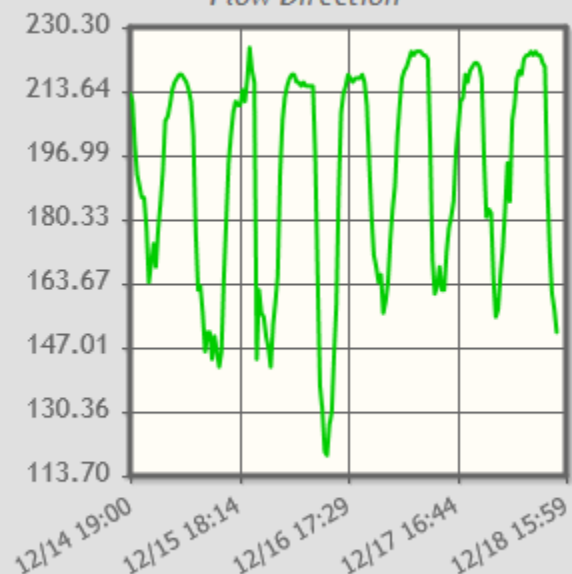
Water Temp.



Flow Speed



Flow Direction



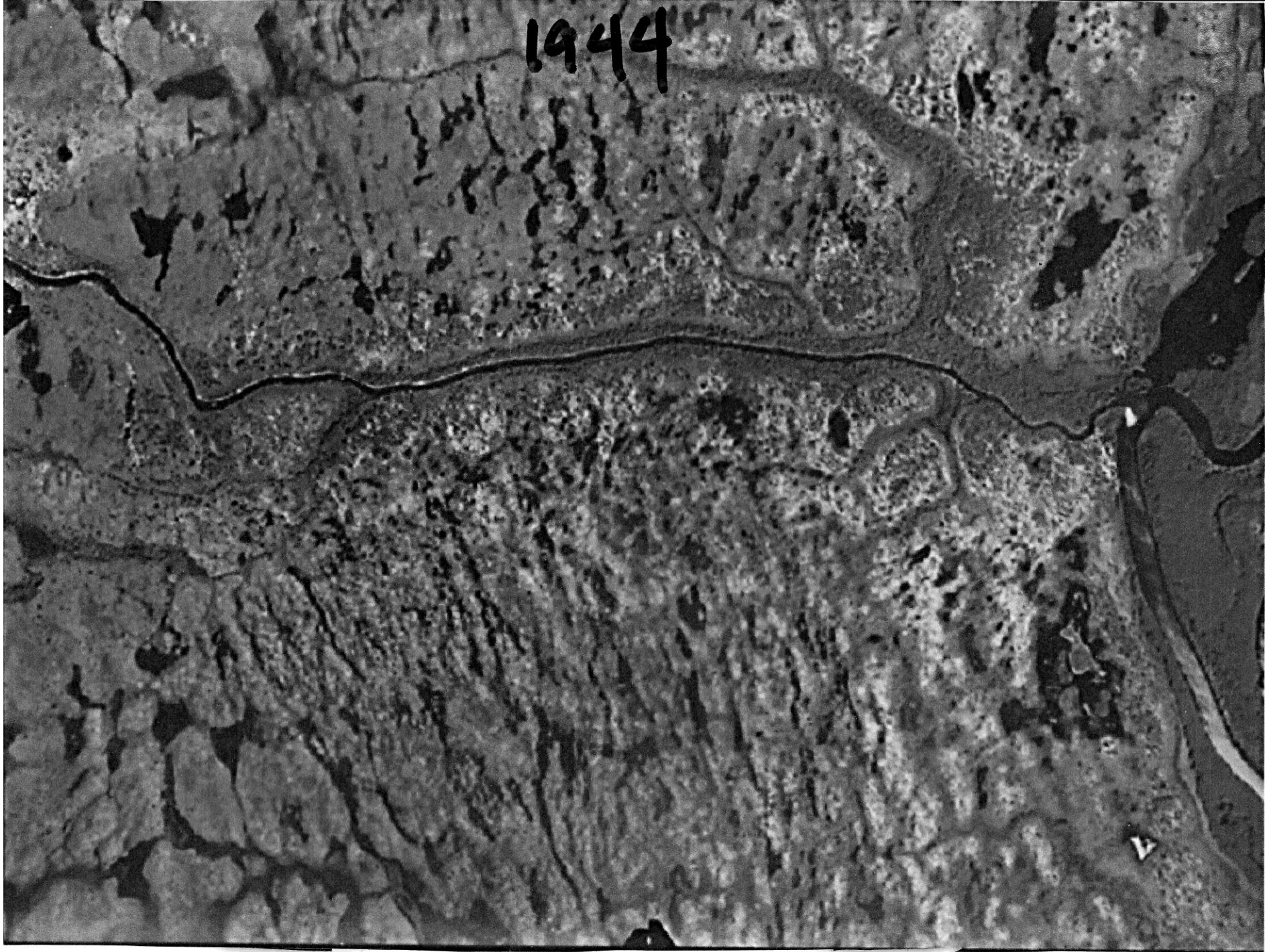
Parameters Measured by Each Kilroy Station:

Flow speed
Flow direction
Depth
Water Temperature
Conductivity
Salinity
Dissolved oxygen
pH
Oxygen Reduction Potential (ORP)
Turbidity
Chlorophyll
Blue Green algae
Colored Dissolved Organic Matter (CDOM)
Nitrite + Nitrate
Ortho – Phosphate

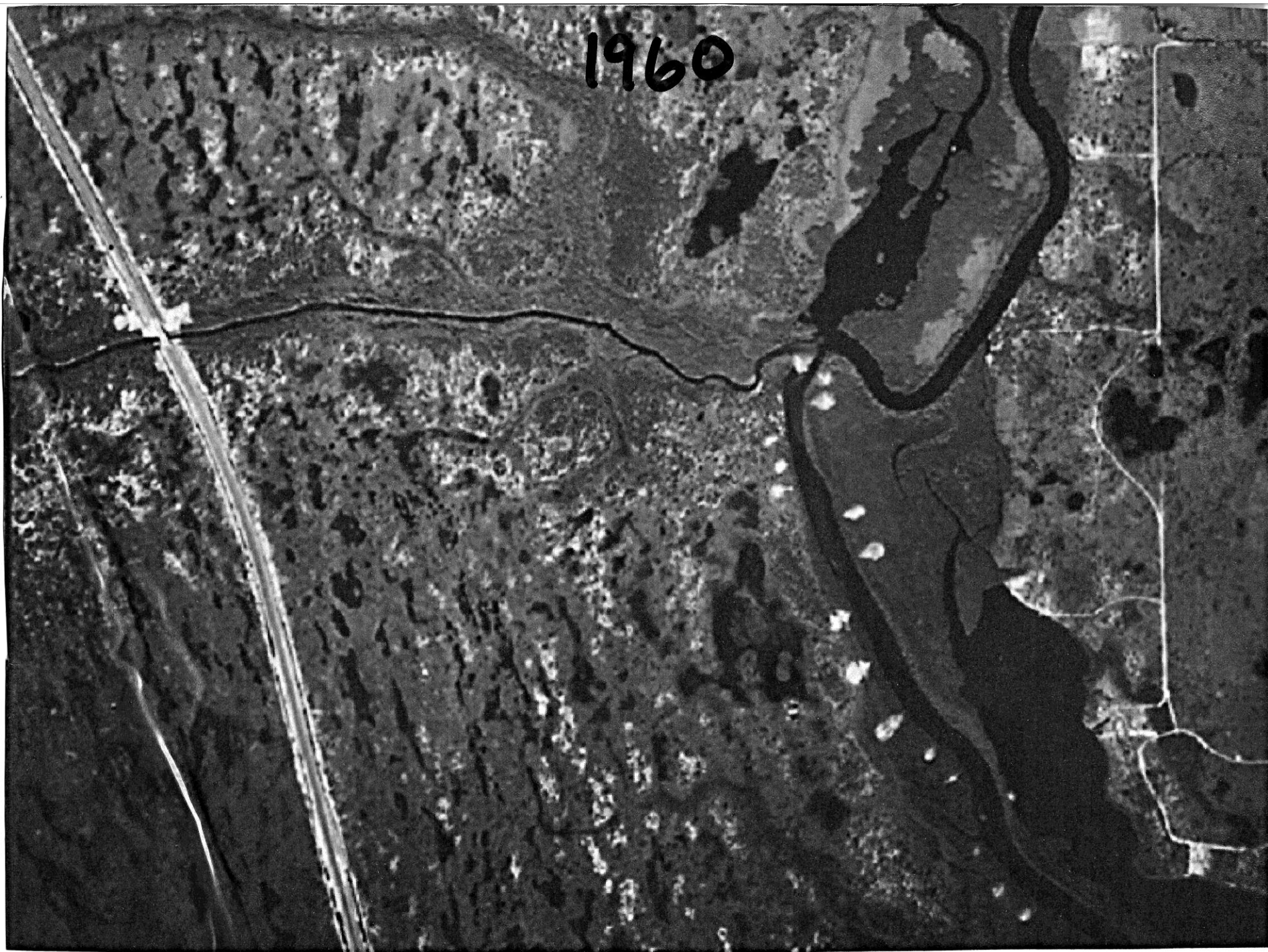
Met Station:

Rainfall
Wind speed
Wind direction
Solar
Barometric pressure
Air temperature

1944



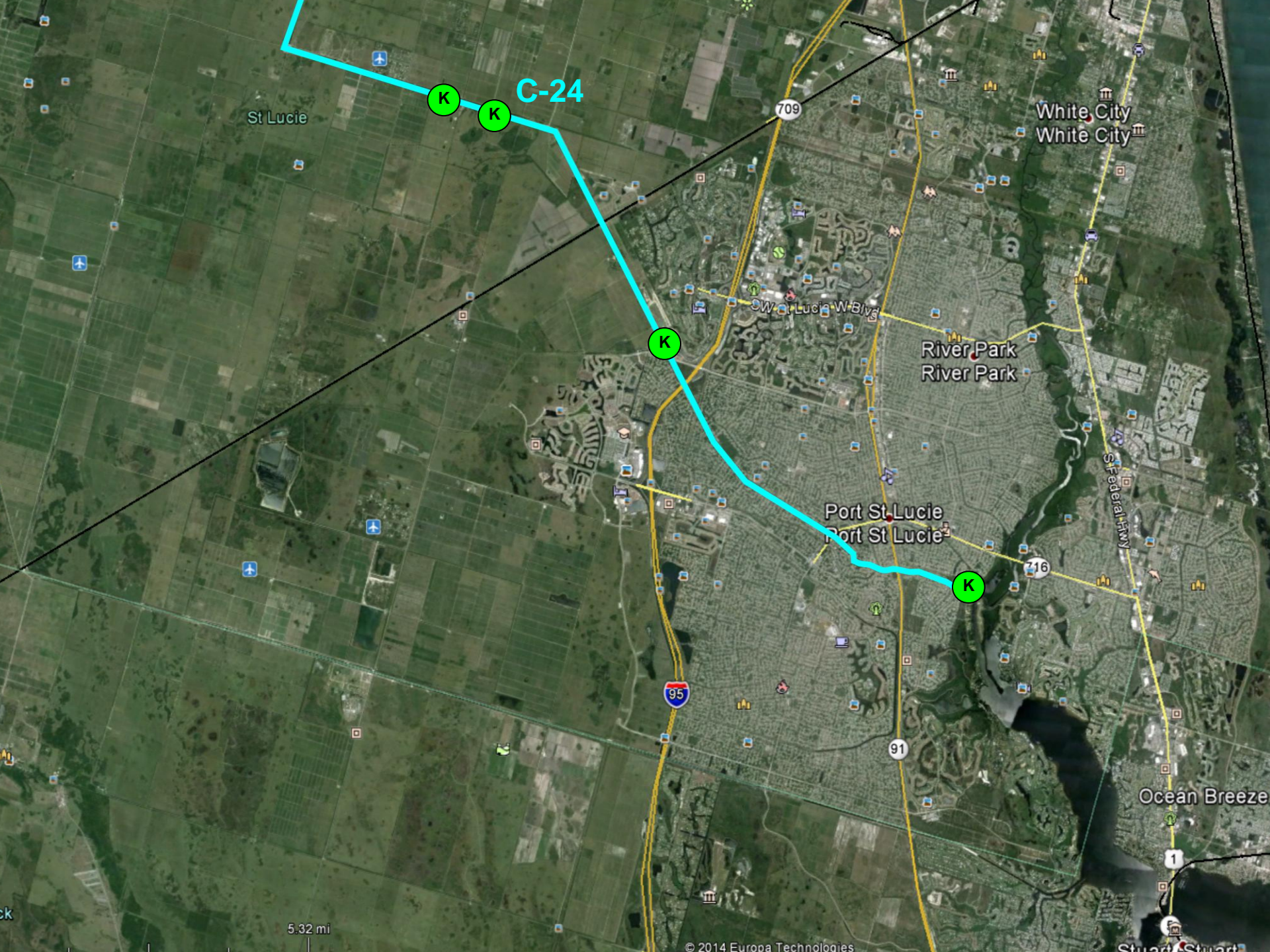
1960



12-29-70

GZB - 2 MM





St Lucie

K

K

C-24

709

White City
White City

SW St Lucie W Bldg

River Park
River Park

K

Port St Lucie
Port St Lucie

K

216

St Federal Hwy

Ocean Breeze

1

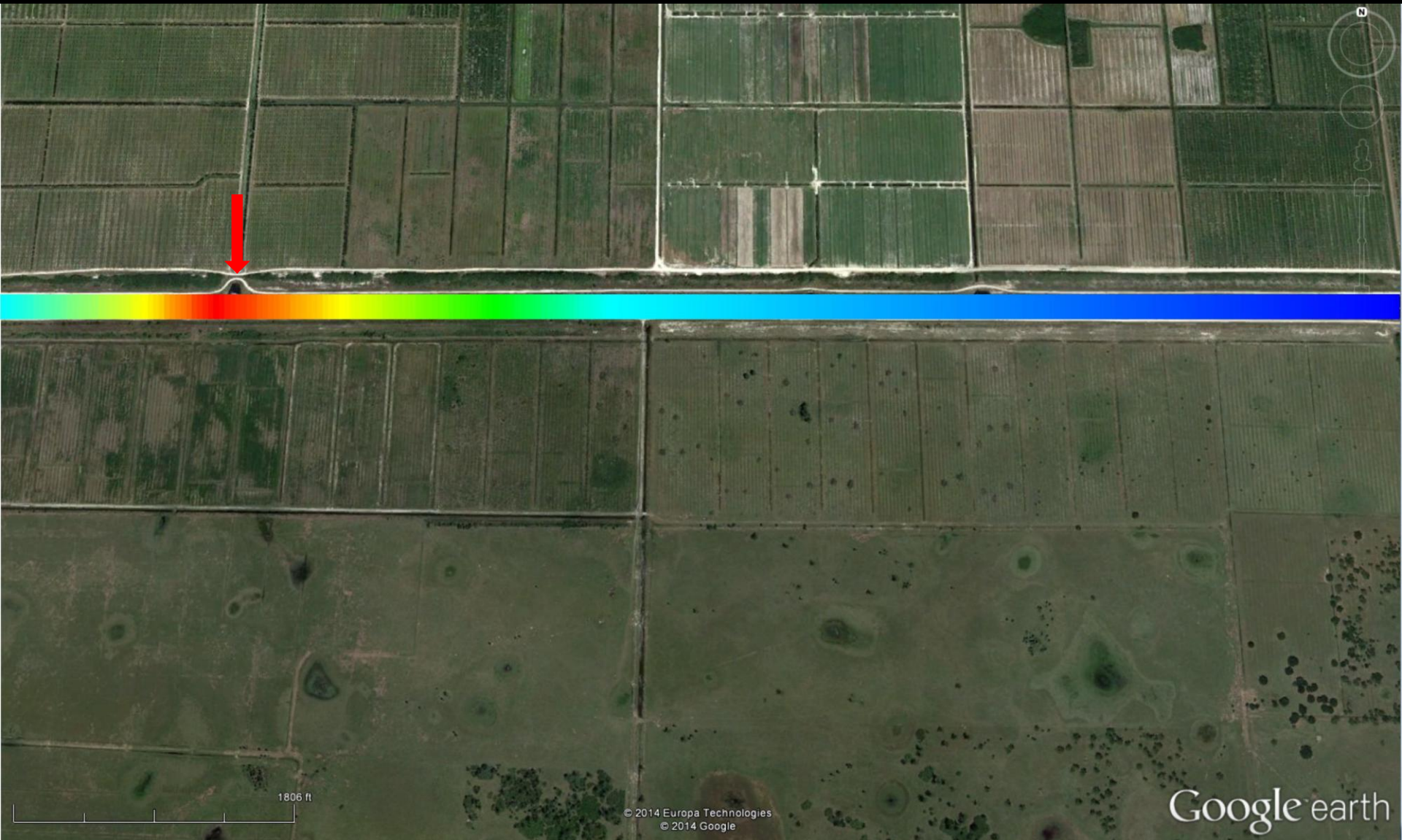
Stuart Stuart

5.32 mi

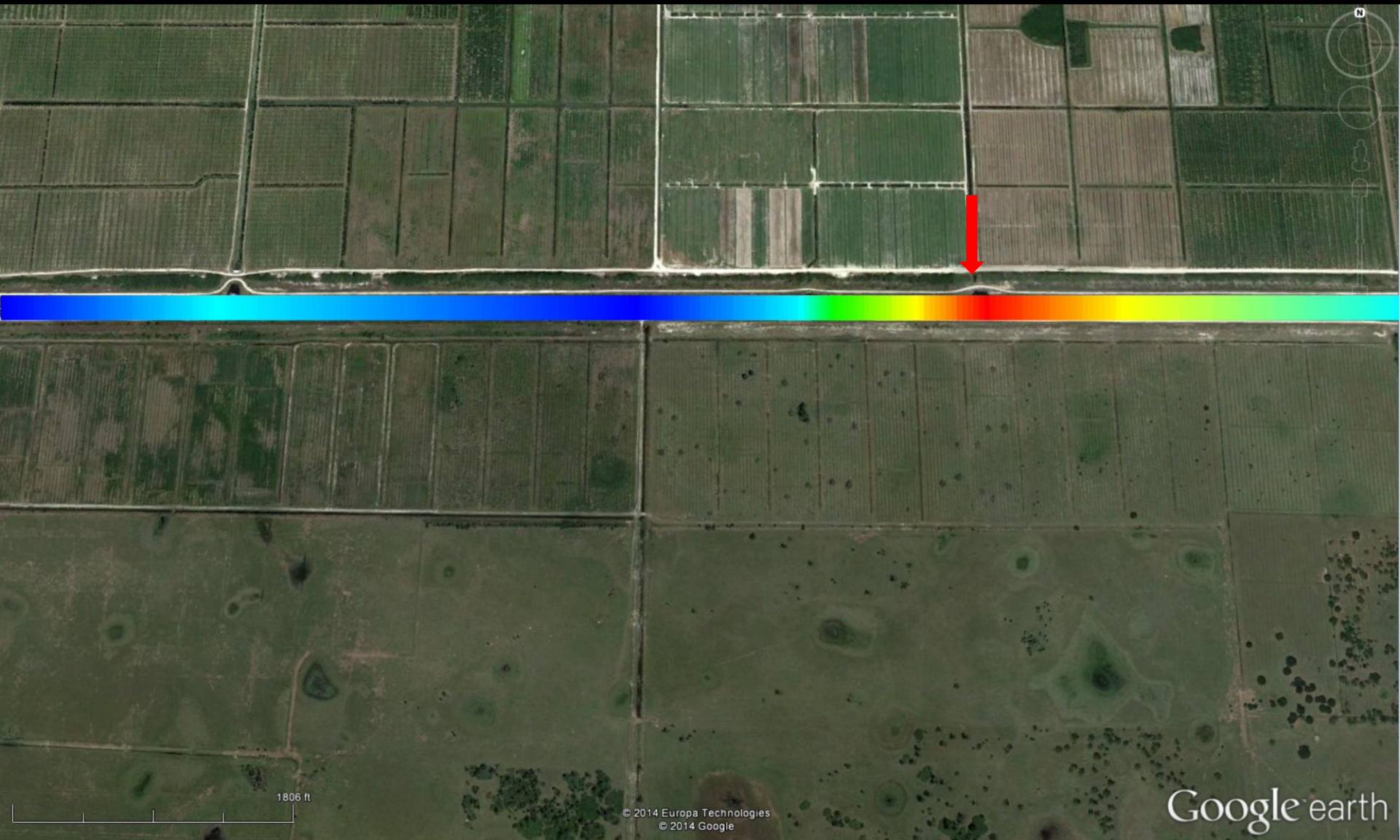
© 2014 Europa Technologies



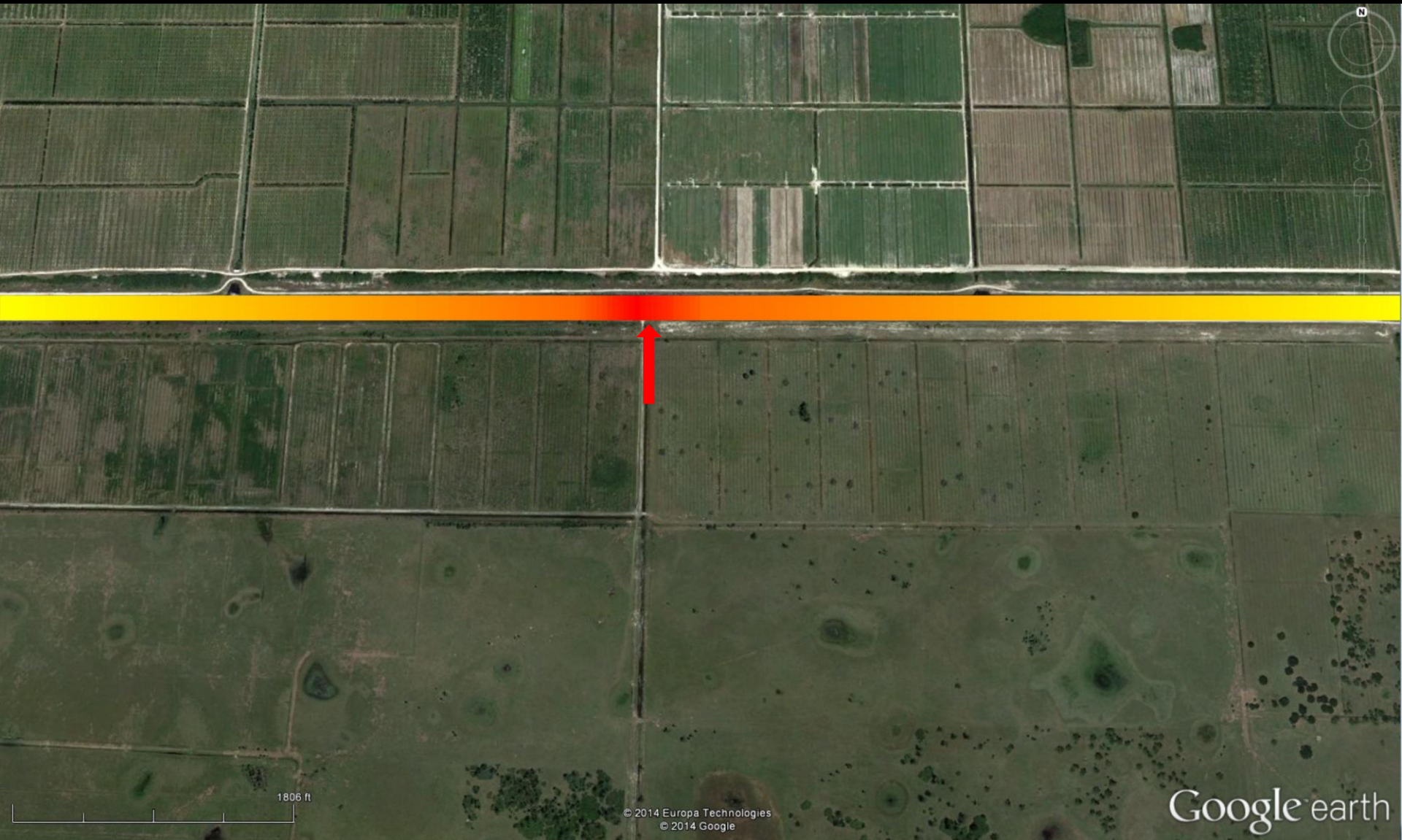
Total Nitrogen

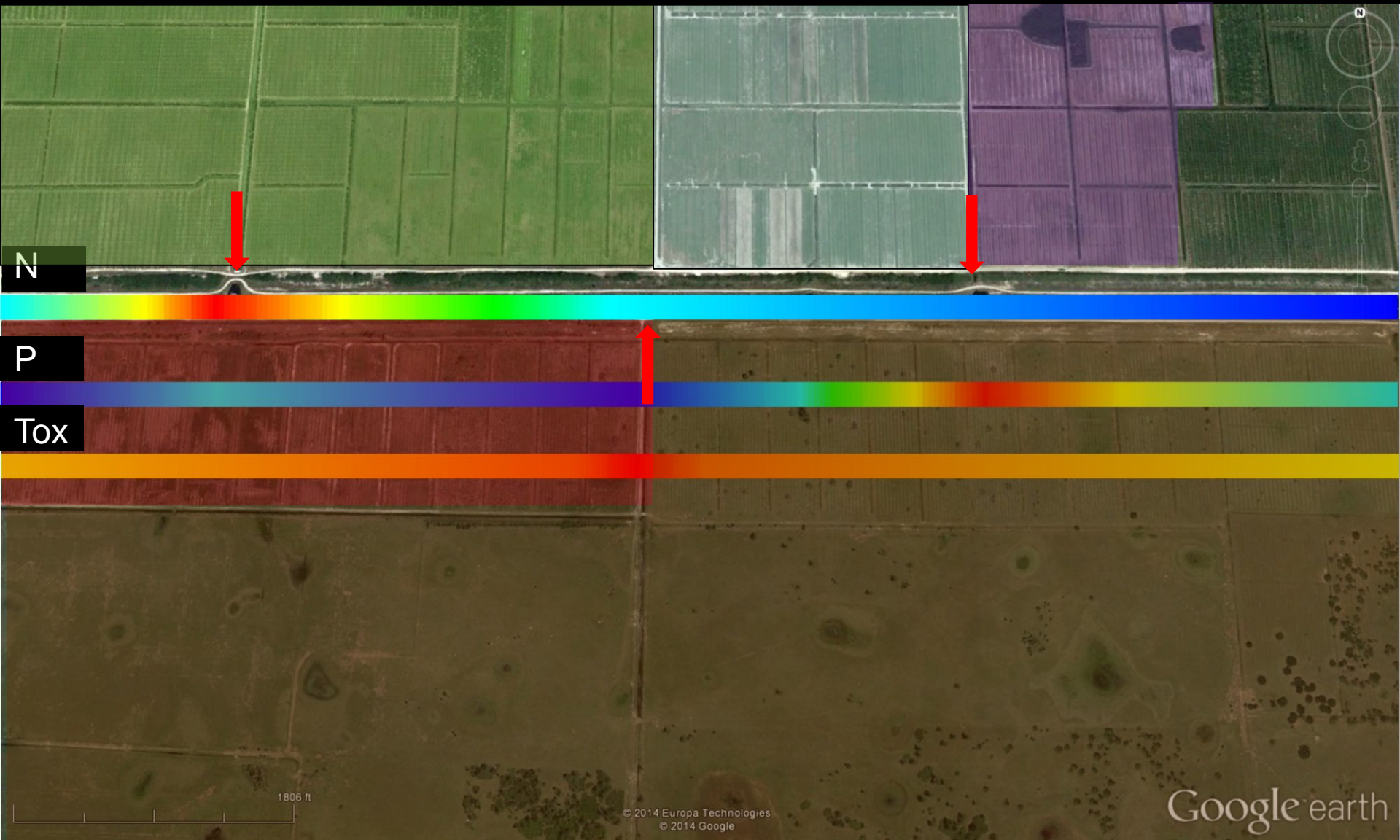


Total Phosphorous

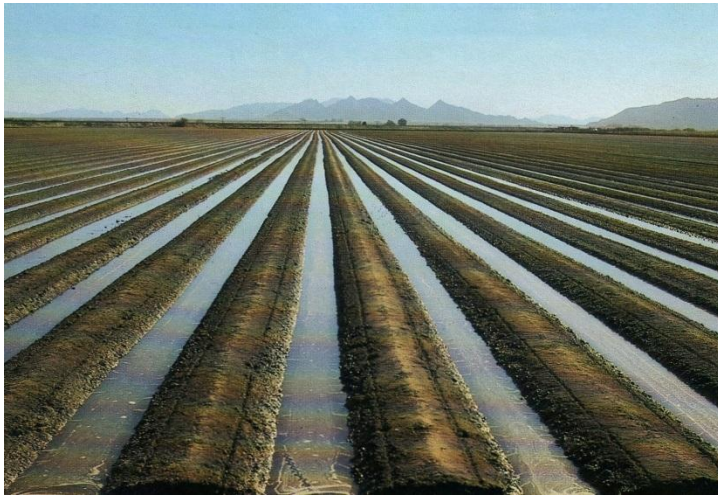


Toxicity





Ag Irrigation Systems



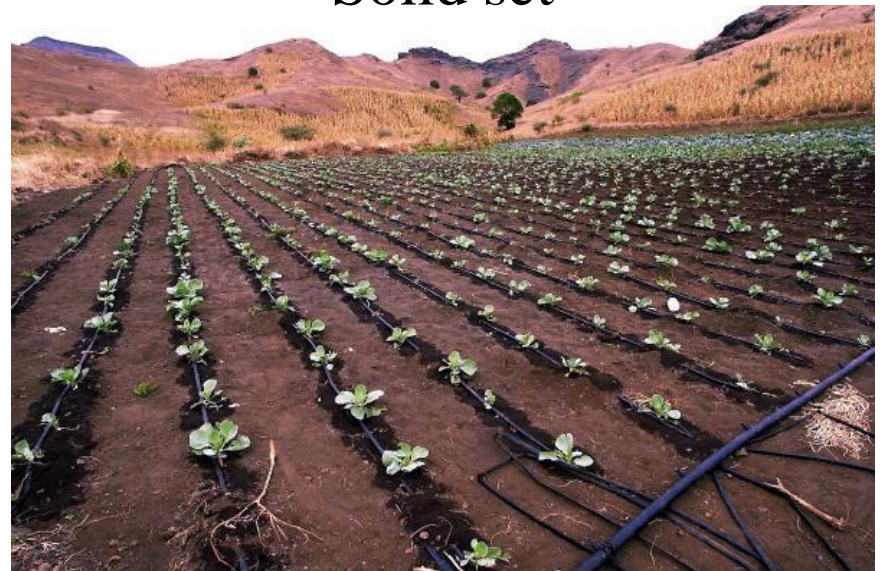
Seepage/subirrigation



Solid set



Linear system



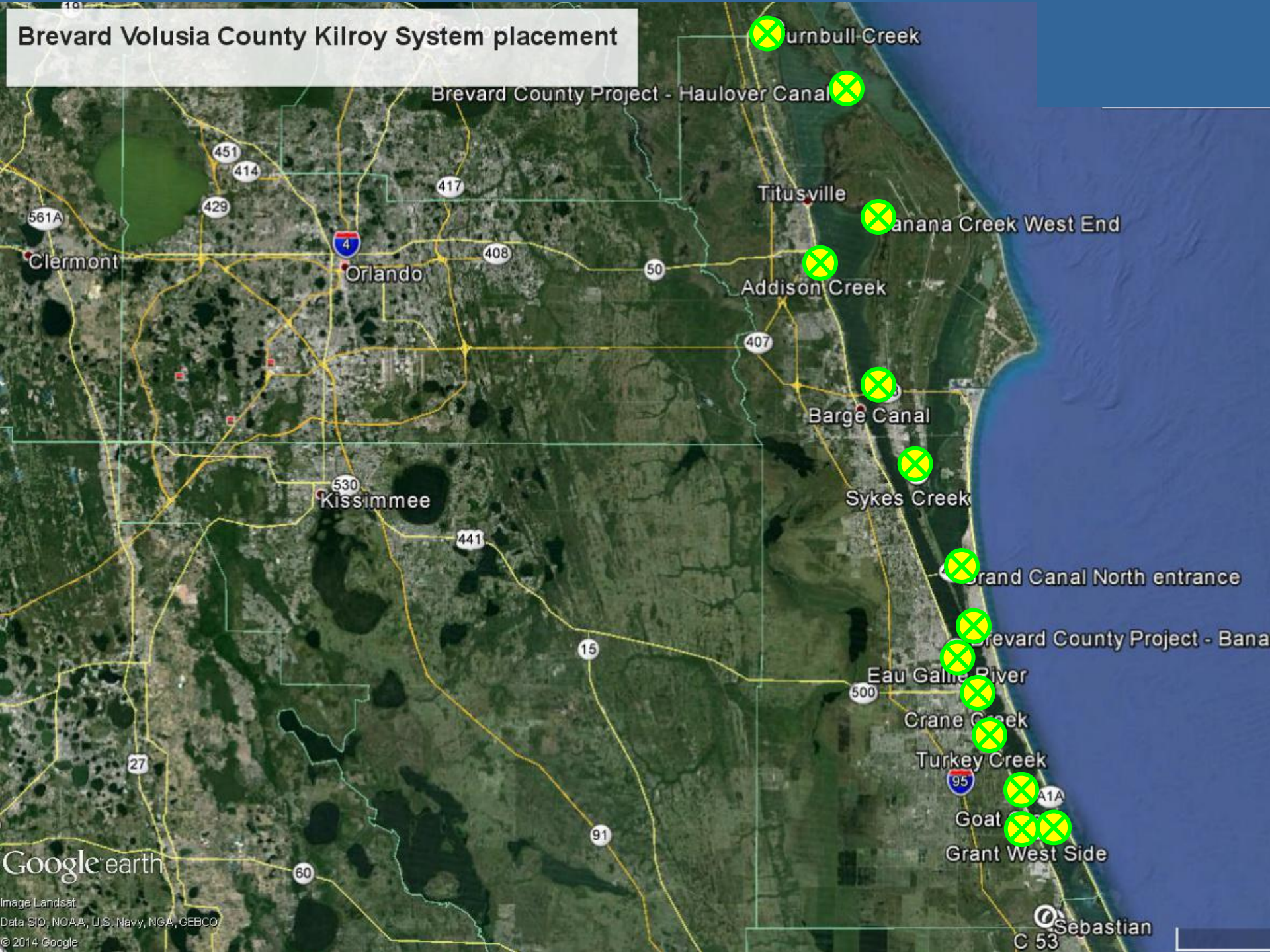
Drip

The 80 20 rule

Roughly 80% of the effects come from 20% of the causes



Brevard Volusia County Kilroy System placement







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